Market Research Request for Information
for
ESDIS Maintenance and Development (EMD) Contract

This request for information is issued by the Earth Science Data and Information System (ESDIS) Project Office of the National Aeronautics and Space Administration (NASA)'s Goddard Space Flight Center (GSFC). Its purpose is to conduct market research by seeking industry comments and inputs concerning a contract for the integrated maintenance and enhancement of software and hardware systems that provide science data management for NASA's Earth Science Enterprise (ESE). The systems are currently deployed at four different locations in the United States. The contractor will be asked to provide maintenance and enhancements to science data management software to sustain the system and to reduce the overall cost of maintenance and operations to the ESDIS project. The contractor will also be asked to provide maintenance and upgrades of the hardware components of the systems. The contractor will also be asked to conduct engineering studies in support of future data system implementation, and will be asked to seek innovative and cost effective ways of supporting current and future data system needs.

The ESDIS Project encourages responses from businesses or other groups interested in this opportunity. The government anticipates that the successful offeror will be experienced in software maintenance, and will have established processes and a flexible pool of qualified human resources to draw upon.

This RFI describes: 1) the context for this work within NASA's Earth Science Enterprise; 2) the Earth Observing System Data and Information System (EOSDIS), a comprehensive data and information system which provides the umbrella context for the contractor's work; 3) the functions of the science data management system; 4) an overview of the elements of work planned for this contract; 5) information about what is requested in response to the RFI; and 6) references. Annex 1 presents specific market research questions for interested parties.

1. Context

NASA's Earth Science Enterprise seeks to develop a scientific understanding of the Earth system and its response to natural and human-induced changes to enable improved prediction of climate, weather, and natural hazards for present and future generations. The Enterprise has established three goals to pursued in carrying out this mission:

- **Science:** Observe, understand, and model the Earth system to learn how it is changing, and the consequences for life on Earth;
- **Applications:** Expand and accelerate the realization of economic and societal benefits from Earth science, information, and technology;
- **Technology:** Develop and adopt advanced technologies enable mission success and serve national priorities.

The vantage point of space provided by NASA led researchers to view the Earth as a dynamic system of land, atmosphere, oceans, ice and life, and gave birth to the interdisciplinary field of Earth System Science. This concept of the Earth as a system shaped the fundamental science questions the Enterprise seeks to answer:

How is the Earth changing, and what are the consequences for life on Earth?

- *How is the global Earth system changing?*
- *What are the primary causes of change in the Earth system?*
- *How does the Earth system respond to natural and human-induced changes?*
- *What are the consequences of change in the Earth system for human civilization?*
- *How well can we predict future changes in the Earth system?*

Earth science is science in the national interest, driving advances in weather forecasting, management of land and water resources, and agricultural productivity. Accordingly, the Earth Science Enterprise includes an applications research and demonstration program in parallel with its science program. Its areas of emphasis are:

- *Resource Management*, including forestry and agriculture;
- *Disaster Management*, including natural hazards ;
- *Community Growth*, including urban and transportation infrastructure; and
- *Environmental quality*, including land cover change.

The Earth Science Enterprise conducts it research in collaboration with a broad range of national and international science agencies. Nationally, these include individual US government agencies, a partnership of 11 federal agencies composing the US Global Change Research Program, and several focused interagency collaborations such as the US Weather Research Program. Internationally, these include the World Climate Research Program and the International Geosphere/Biosphere Program sponsored by such entities as the United Nations Environment Program and the World Meteorological Organization.

To answer the call for global scale observations sufficient to detect variability, trends, and causes of change in the Earth system, the Earth Science Enterprise is deploying the Earth Observing System (EOS) of satellites. Four have already been launched and are operating: Landsat 7, QuikSCAT, ACRIMsat, and Terra, the EOS flagship mission carrying five different instruments. The balance of the EOS first series will be launched through 2003, including the multi-instrument Aqua and Aura missions, and the more focused Jason, ICEsat, SORCE and SAGE III missions. Complementing EOS are a series of small exploratory missions to measure Earth system forcings and responses, beginning in 2002, as well as a variety of suborbital platforms (e.g., aircraft and balloons) for *in situ* and remote sensing.

Data and information management system services are as essential as satellite observations to the success of the Earth Science Enterprise. Observing systems generate enormous quantities of data (over 1 terabyte per day) which must be acquired, processed, archived and distributed. Data acquired from satellites must be processed into globally consistent, calibrated, long-term data records. Diverse data sets must be combined to produce meaningful information on Earth

system interactions. Data must assimilated into Earth system models. And these large volumes of data must be moved around, exchanged among researchers at geographically diverse institutions. Finally, data must broadly available—stored in ways that are not only accessible, but also understandable to users from a variety of science and applications disciplines.

2. EOSDIS

To perform these functions in the EOS era, the Enterprise has developed the EOS Data and Information System (EOSDIS). EOSDIS is being deployed in a series of releases timed to support the phased launches of major EOS missions. EOSDIS is currently operating and managing data from the EOS missions now in orbit, and preparing for the upcoming launch of Aqua. Subsequent releases will support Aura (2003) and other EOS missions leading up to it. EOSDIS is a comprehensive data and information system designed to perform a wide variety of functions in support of a heterogeneous national and international user community. To this end, EOSDIS provides a spectrum of services including:

- Spacecraft command and control
- Data capture and telemetry processing
- Science data product generation
- Data archive management
- Search and order of science data
- Data distribution to a broad spectrum of users

User support

EOSDIS is comprised of a variety of heterogeneous component systems that collectively perform the EOSDIS services in an integrated fashion. Central among these is the EOSDIS Core System (ECS) that provides the common capabilities and infrastructure of EOSDIS. Within ECS is the Science Data Processing Segment (SDPS), a key product that is the focus of this RFI.

3. Functions of Science Data Management

The SDPS:

- Generates science products from EOS observations,
- Accepts science products produced by Principal Investigators and International Partners,
- Accepts ancillary and supplementary data products for storage and distribution,
- Provides interfaces to instrument and interdisciplinary investigators' Science Computing Facilities (SCFs), which develop science data processing software and perform scientific research,
- Provides data archiving and distribution capabilities,
- Interfaces with the EOS Data Gateway for customer search and order of data.

ECS SDPS development is currently scheduled to be completed in October 2002. The SDPS will continue to evolve within the framework of the New Data and Information Systems and Services (NewDISS). NewDISS refers to the distributed Earth science data systems and services, which,

over the next 6 – 10 years, will evolve after the EOSDIS. NewDISS will consist of a heterogeneous mix of interdependent components derived from the contributions of numerous individual investigators and institutions. It is expected to be a flexible environment that can change readily to accommodate new technology and programmatic imperatives. The SDPS will be an initial component of NewDISS and is expected to meet the NewDISS imperatives.

NASA began conceptual planning for NewDISS in the summer of 1998. The more heterogeneous processes and contributions for securing and providing data and information services called for in the NewDISS concept are expected to reduce the overall cost of providing Earth science data and information systems, and products and services, to the user community, a major goal for NASA Earth Science Enterprise.

4. Contract Overview

The initial task under the EMD contract will be for the transition of ECS maintenance and development. Under NASA Contract number NAS5-60000, the current development contractor is scheduled to deliver the completed ECS by the end of 2002, at which time the EMD contractor will be tasked to be fully responsible the SDPS. In an effort to minimize any risks associated with such a transition between the development and the EMD contractor, NASA intends to award the contract early enough to allow a lengthy transition period.

Once the transition is complete, the contractor will be tasked to be fully responsible for ensuring the reliability, availability, functionality, operability and performance of the science data processing system. The contractors' proposed priorities and goals should be consistent with the priorities and goals of the NASA team, consisting of the ESDIS Project, the Distributed Active Archive Centers (DAACs), the science investigator teams, and the user community. To this end, the Government anticipates that offeror proposals will include distinct, but inter-related elements:

(1) transition planning

(2) performing preventive and corrective maintenance on COTS hardware, COTS software, and custom software to ensure that the SDPS attains and maintains the required performance specification levels, and to lower the overall cost of maintenance and operations of the systems,

(3) performing hardware and software perfective enhancements to implement new requirements, and to lower overall cost of maintenance and operations,

(4) conducting engineering studies of approaches and performance/cost trades which should result in reductions in maintenance costs of the system and/or improved performance at minimal increases to the investment level the Government has made, and

(5) integrating controlled enhancement/upgrades to the SDPS as a result of the engineering studies completed at the direction of the Government or value engineering changes proposed by the EMD contractor.

This effort will also require the EMD contractor to perform the necessary ancillary tasks including, but not limited to, interface management, requirements management, configuration and property management, system verification, problem management, change management, and program management and quality assurance. Performance of the contract may require additional studies, development implementation, and maintenance in support of EOSDIS (e.g., NewDISS) as described in the statement of work.

5. Information Requested in the RFI

The Government is considering all options for our contract approach but would like your insights on an indefinite-delivery/indefinite-quantity (IDIQ) contract with cost-plus-award/incentive/fixed-fee and firm-fixed-price task orders or a combination of these tasks under a single contract. The minimum contract value would be equivalent to the selected contractor's proposed price to provide the necessary support to maintain the SDPS at the desired performance specification levels for a two (2) year period. Additional task orders would be issued, as needed, to conduct engineering studies as well as implement Government-approved enhancements and/or upgrades to the system.

The Government is also considering the following alternatives, individually and in combination, as options to incentivize contractor performance:

- Award fee performance incentives based on the Contractor's ability to support Mission requirements and meet other performance/functional standards which cannot otherwise be quantifiably defined
- Incentive fee incentives based on the Contractor's ability to attain and maintain desired system performance specifications
- Award-term contract terms and conditions by which the contract may be extended as a reward for optimal performance (award-term features may be traded for award-fee incentives)
- Value-Engineering approach—voluntary and mandatory—consistent with that found at FAR 48.101(b)
- Provide fee as a share of cost savings to the government from reducing the overall cost of operating and maintaining the ECS, and the larger EOSDIS system.

To view a copy of the ECS development contract's Statement of Work (SOW), Functional and Performance Requirements Specification (F&PRS), or other contractually related documents, go to http://spso.gsfc.nasa.gov/emd/ and click on "ECS Documents".

For an understanding of the scope of the current ECS performance capabilities, respondents should review the other documents provided at the aforementioned website. These documents

serve as a backdrop against which respondents must frame and pose their responses to this request for information.

Interested parties (including potential offerors, end users, Government acquisition and supporting personnel, and others involved in the conduct or outcome of the acquisition) with information relevant to this request are asked to respond by submitting a white paper of ***no more than thirty (30) pages*** which conforms to **Annex 1**, "Market Research Questions For ESDIS Maintenance and Development (EMD) Contract". The paper should clearly address a prospective EMD service contractor's approach to providing the needed services. The EMD Statement of Work, the RFI, and the Market Research Questions are available on line at http://spso.gsfc.nasa.gov/emd/.

The Government does not intend to pay for the information solicited except as an allowable cost under other contracts as provided in subsection 31.205-18, "Bid and Proposal Costs," of the Federal Acquisition Regulation. Although "proposal" and "offeror" may be used in this request for information, your response will be treated as information only. It shall not be used as a proposal. However, respondents of this request for information may be invited for "one-on-one meetings" to further discuss the provided feedback at the conclusion of this study. As such, protection of any exchange of information will be consistent with procurement integrity requirements (see FAR 3.104).

In accordance with FAR Subpart 15.2, the purpose of the RFI is to communicate and improve the understanding of Government requirements and industry capabilities, thereby allowing potential offerors to judge whether or how they can satisfy the Government's requirements, and enhancing the Government's ability to obtain quality supplies and services at reasonable prices and increase efficiency in proposal preparation, proposal evaluation, negotiation, and contract award. Consequently, the Government hopes to identify and resolve concerns regarding the acquisition strategy, including proposed contract type, terms and conditions, and acquisition planning schedules; the feasibility of the requirement, including performance requirements, statements of work, and data requirements; the suitability of the proposal instructions and evaluation criteria, including the approach for assessing past performance information; the availability of reference documents; and any other industry concerns or questions.

SCHEDULE:

Deadline for Submission: February 19, 2001

Responses may be sent via electronic mail, regular mail, or fax to:

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If you respond via regular mail or fax, please provide an electronic copy in Microsoft Word format in addition to the printed version of your submission.

6. References

For a complete description of NASA's Earth Science Enterprise, go to the Enterprise's official Internet web site homepage found at: http://www.earth.nasa.gov/.

For more information regarding the Earth Observing System, see the 1999 EOS Reference Handbook found at: http://eospso.gsfc.nasa.gov/eos_homepage/misc_html/refbook.html

Other informative Internet links (including the statement of work for this requirement) can be found at the 'EMD RFI Home Page' at http://spso.gsfc.nasa.gov/emd/. Attachment D of the statement of work entitled "ECS Science System Sizing and Capacities Summary" provides a general idea of the magnitude of this effort.